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REMOTE TARGET CONTROL SYSTEM

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

Your petitioners, Spencer Lambert and H. Addison Sovine, citizens of the United States and residents of Utah, whose post office addresses are 160 South 900 West, Provo, Utah 84601 and P.O. Box 636, Provo, Utah 84603, respectively, pray that letters patent may be granted to them as inventors of the improvement in a Remote Target Control System as set forth in the following specification.

RELATED APPLICATIONS

[0001] The present application claims the benefit of the filing of U.S. Provisional Patent Application No. 60/246,437, filed November 7, 2000.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to mechanisms for moving targets used at shooting ranges and the like in order to test the skill of the shooter under more life-like conditions. More particularly, the present invention relates to the use of a telephone to selectively actuate targets to more accurately test the abilities of the shooter.

2. State of the Art

[0003] In order to maintain proficiency in the use of various types of firearms, it is common for law enforcement officers, military personnel and sportsmen to engage in target practice. In conventional target practice, a target, i.e. an outline of a person, vehicle or animal is held before a bullet trap (or other type of range). The trap receives bullets fired at the target and contains the bullet so that it may be retrieved and recycled. Such traps include total containment systems wherein the bullet is received in a chamber, and less expensive berm traps in which the

bullet is received by a bullet deceleration medium, such as sand or small rubber granules.

[0004] While target practice at stationary targets improves accuracy in that context, it fails to prepare the shooter for most real life situations. For example, a police officer shooting at a stationary target may obtain a high degree of accuracy in that scenario. However, for most sportsmen, law enforcement officers and military personnel, the situation in which the real target remains stationary is rare. Usually in military or law enforcement contexts, the target will be moving, and in many cases the target may be returning (or instigating) fire.

[0005] To ensure that they are properly trained for such real-life conditions, it is important that law enforcement agents, military personnel and hunters have experience firing at targets are not simply stationary. In attempts to provide more realistic training scenarios, numerous systems have been designed which move the target during shooting practice. For example, a computer can be used to selectively turn targets and thereby test the reflexes of the shooter.

[0006] One common problem with such embodiments, however, is that the computer controls can rarely adapt to the particular strengths and weaknesses of the shooter. For example, a police officer may have very good reflexes on his or her right side, but may struggle when targets suddenly appear on his or her left side.

A conventional computer program will simply run through the shooting drill. A different program must be run to address the reflex disparity.

[0007] Thus, there is a need for a system in which a person overseeing the target range can target control turning and movement from a remote location to better customize the target movement to the needs of the shooter.

SUMMARY OF THE INVENTION

[0008] Thus, it is an object of the present invention to provide an improved method and apparatus for moving and/or turning targets and otherwise actuating target range devices, such as lights, horns, track runner targets and the like.

[0009] It is another object of the present invention to provide such an improved method and apparatus which is easy to use and relatively inexpensive.

[0010] The above and other objects of the invention are realized in specific illustrated embodiments of a remote control target system and method of use which includes a target control processor, a remote control unit, and an interface for communicating between the remote control unit and the target control processor.

[0011] In accordance with one aspect of the present invention, the remote control unit includes a telephone which is configured to send signals to the target control processor responsive to pressing

keys on the telephone.

[0012] In accordance with another aspect of the present invention, the remote control unit is formed by a cordless telephone. The handset of the cordless telephone handset is used to transmit signals responsive to pressing the keys on the handset. The handset conveys signals to the base unit, which, in turn, conveys signals to the interface. The interface then forwards the signals to the processor so that the processor turns or moves targets or other target range device in response to the user pressing keys on the cordless telephone.

[0013] In accordance with another aspect of the invention, the telephone is connected to an interface, which is then connected directly to target controls. This allows a telephone to be used to control system without the use of a computer.

[0014] In accordance with yet another aspect of the present invention, a touch tone decoder is used in accordance with a analog circuit to facilitate control of the targets.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The above and other objects, features and advantages of the invention will become apparent from a consideration of the following detailed description presented in connection with the accompanying drawings in which:

[0016] FIG. 1 shows a schematic view of a remote target control

system made in accordance with the principles of the present invention;

[0017] FIG. 2 shows a wiring diagram in accordance with an alternate embodiment made in accordance with the principles of the present invention; and

[0018] FIG. 3 shows a schematic view of yet another remote control target system in accordance with the principles of the present invention.

DETAILED DESCRIPTION

[0019] Reference will now be made to the drawings in which the various elements of the present invention will be given numeral designations and in which the invention will be discussed so as to enable one skilled in the art to make and use the invention. It is to be understood that the following description is only exemplary of the principles of the present invention, and should not be viewed as narrowing the pending claims.

[0020] Referring to FIG. 1, there is shown schematic view of a remote target control system formed in accordance with the principles of the present invention. The remote target control system includes a cordless telephone 10 with a hand set 14 and a base unit 18. The base unit 18 is connected by a power cord 22 to a conventional power socket 26. The base unit 18 is also connected by a telephone cord to an interface box 30. The interface box 30

in disposed in communication with a controller 34, which is, in turn, disposed in communication with a processor, such as a computer 38.

[0021] The remote target control system is a useful tool. In general, it gives you eight (8) independent channels that are controlled remotely. As shown in FIG. 1, the wireless control is gained by using a standard cordless telephone 14/18. This gives the user many choices. It also makes finding replacements extremely easy and prevents the user from being tied to proprietary remote controls which can be expensive to purchase.

[0022] When a number is pushed on the cordless telephone 14, the signal is conveyed to the base unit 18 and over a telephone or other cable 28 to the interface box 30. The signal is then sent over a line 32 to the actuator 34 and then over a line 36 to the computer 38.

[0023] The telephone 10 also requires 120 volts AC which is provided by the power chord 22 and outlet 26. The telephone base unit 10 and the interface 30 can be 100-150 feet apart. Additionally, because the hand set 14 can be a considerable distance from the base unit 10, the person controlling target actuation can be a hundred yards from the controller 32 or 44. This allows the person controlling actuation to either allow the computer to run a predetermined scenario, or to interrupt or

override when he believes it is necessary to improve the shooter's skills.

[0024] The remote target control system has (3) modes to work in, Manual, Time Full Seconds, Timed Tenth of a Second. The Manual mode gives the ability to turn channels ON and OFF by a press of a key. The two Times modes offer the ability to input a time in seconds. Then turn on pre-selected channels for that given time. These modes are explained in greater detail below.

[0025] FIG. 2 shows an alternate embodiments in which the controller 34 (FIG. 1) and the interface 30 (FIG. 1) are combined into a single unit. Thus, the remote target control system has a main controller board 44 with a 12 volt DC in 46, phone in 50, and 8 channel outputs 54. The 12 volt DC in 46 is located on the left side of the board. A black terminal strip is used to connect the 12 volts. A RED wire is for + 12 volts DC. The BLACK wire is for NEGATIVE.

[0026] The phone jack connector 50a is located on the bottom side of the board. This works much like a wall phone jack in a home. Simply, plug one end into the controller board 44 and the other end into the cordless telephone 10, or a conventional telephone. When a signal is received from the telephone, the board 44 sends a signal over the output lines 54 to actuate the appropriate target. Thus, without the need for a computer, the

[0027] The eight outputs 54 located on top of the main board 42 in FIG. 2 are 12 volt DC outputs. These can run target valves, and many other electrical devices.

[0028] There are three (3) modes offered by the remote target control system of the present invention. Any mode can be switched to from any other mode. Simply, type in the command to change to that mode. The lights on the board turn on when the corresponding channel is activated.

Manual Mode

[0029] Upon power up, the remote target control system enters this mode with all channels activated. Keys 1-8 toggle the corresponding channel, either ON or OFF. The # key will toggle all selected channels ON or OFF.

[0030] The following is a list of commands used in this mode.

Command Function:

- 1 toggles channel one (ON/OFF)
- 2 toggles channel two (ON/OFF)
- 3 toggles channel three (ON/OFF)
- 4 toggles channel four (ON/OFF)
- 5 toggles channel five (ON/OFF)
- 6 toggles channel six (ON/OFF)
- 7 toggles channel seven (ON/OFF)
- 8 toggles channel eight (ON/OFF)

toggles all selected channels (ON/OFF)

*OM enters Manual Mode

*06 enters Manual Mode

When a channel is turned on it becomes selected. When the # key is pressed, it toggles all selected channels OFF. The channels that were selected stay selected even though they are OFF. So, when the # key is pressed the second time, the selected channel(s) turn back ON. When no channels are activated (ON) and a number is pressed, that channel is now the only one selected. When you change to other modes, the selected channels are remembered, even though the channels may not have been activated (ON).

Timed, full Second Mode

[0031] To enter this mode type *01. The default time is set to 1 second. To change this time press *(new time)*. Example: *5* would set the new time to 5 seconds. To execute this time, press the # key. The selected channels will turn ON for the set time, then turn OFF.

[0032] The following is a list of commands used in this mode.

<u>Command</u>	<u>Function</u>	<u>Example</u>
* (new time)*	set new time	*15* (sets the new time to 15 seconds)
#	execute set time	
*01	enters Timed, Full Second Mode	

[0033] When a time has been executed, a new time can still be entered and executed over top of the previous time. This can be helpful when a long time was accidentally executed. Say, 50 seconds was entered. This could be stopped sooner by entering a new time.

Timed, Tenth of a Second Mode

[0034] To enter this mode, type *08 or *0T. The default time is set to 0.1 second. To change this time, press *(new time)*. Example: *25* would set the new time to 2.5 seconds. To execute this time, press the # key. The selected channels will turn ON for the set time, then turn OFF.

[0035] The following is a list of commands used in this mode.

<u>Command</u>	<u>Function</u>	<u>Example</u>
* (new time)*	set new time	*55* (sets the new time to 5.5 seconds)
#	execute set time	
*0T	enters Timed, Tenth of a Second Mode	
*08	enters Timed, Tenth of a Second Mode	
[0036]	When a time has been executed, a new time can still be entered and executed over top of the previous time. This can be helpful when a long time was accidentally executed. Say, 22.5 seconds was entered. This could be stopped sooner by entering a	

new time.

CORDLESS ULTRA INTERFACE

[0037] The cordless interface 30 provides an easy way to talk to the range computer. By sending a signal to the input channels of the Modula 34, a cordless telephone can give commands to the computer.

MESSAGE FLOW

[0038] It is helpful to understand the flow of the message sent to the computer. When a key is pressed on the handset 14, the signal goes to the base unit 18. This is then sent to the cordless interface 30. The interface 30 sends a signal to the controller 34 and the controller sends it to the processor 38. This signal shows up on the computer as a **Target Hit** on the corresponding channel. Typically, the following phone keypad numbers correspond with these channels.

<u>Phone Keypad</u>	<u>Ultra Channel</u>
1	1
2	2
3	3
4	4
5	5
6	6

7	7
8	8
9	9
0	10
*	11
#	12

EXAMPLE PROGRAM

[0039] What the computer 38 does when a key is pressed is all up to the ultra program. This is the program running on the computer. Usually, this program is set to loop, this way it always watches the channel hit inputs. The following is a sample program of one way this can work.

Phone.ult (entry program this one loops)

1. if hit1>0 t=1: run Turn.ult
2. if hit2>0 t=2: run Turn.ult
3. if hit3>0 t=3: run Turn.ult
4. if hit4>0 t=4: run Turn.ult
5. if hit5>0 t=5: run Turn.ult
6. if hit6>0 t=6: run Turn.ult
7. if hit7>0 t=7: run Turn.ult
8. if hit8>0 t=8: run Turn.ult
9. if hit9>0 t=9: run Turn.ult
10. if hit10>0 t=10: run Turn.ult

11. if hit 11>0 run AllOn.ult
12. if hit12>0 run AllOff.ult
13. update
14. go to 1

Turn.ult (this turns the targets for the time that t is set for)

1. out1..maxout=on
2. wait t
3. out1..maxout=off
4. run Phone.ult

AllOn.ult (this program when run turns all the targets on and leaves them on)

1. out1..maxout=on
2. run Phone.ult

AllOff.ult (this turns all targets off)

1. out1..maxout=off
2. run Phone.ult

[0040] These four programs work together and give full wireless turning control. The run command is used to run other programs. It is important to use the run command because it resets the hit count for all targets.

[0041] While the programs described above relate to the embodiment in FIG. 1, it will be appreciated that the embodiment described with respect to FIG. 2 is substantially less complex and

does not include the multiple modes. Rather, it provides a simple, reliable system wherein the operator of the shooting range can manually control actuation of the targets without requiring proprietary remote controls. Additionally, it could be done discretely by having the target range operator use a cellular telephone to communicate with the interface (directly or via another telephone). This would allow a commanding officer in a military/law enforcement situation to actuate target movement or modify target movement without others knowing that the targets were being controlled. In such a scenario, the commanding officer to continually adjust the presentation of targets to improve problem areas in his troops reactions while appearing to simply be using a cellular telephone.

[0042] While a cordless telephone is preferred, it will be appreciated that telephones other than cordless telephones can also be used. For example, FIG. 3 shows the use of a conventional push button telephone 60 in which the hand-set 64 is attached to the base unit 68. Unlike a cordless telephone which must typically have its own power supply, the telephone 60 can be powered by a telephone cord 70 which connects the telephone to an controller 74.

[0043] The controller 74 is configured to translate signals sent by the telephone 60 through the telephone cable 70, and relay them over an appropriate wire 78 so as to actuate a target, such as that

shown at 80. The controller 74 can be achieved in a number of ways. For example, the controller 74 can be formed by a touch tone decoder which converts the tone generated into a signal for an appropriate line. For example, pressing number 1 on the telephone 60 will send a signal to the controller 74, which in turn sends a signal over wire 78a to actuate target 90. The signal sent over line 78a can be of any type to which the target 80 is responsive. For example, a solenoid could be used to rotate the target 80, and the wire 78 is used to power the solenoid into a position exposing the target.

[0044] In the alternative, the controller 74 can simply be an analog circuit which responds to the signals input by the telephone 60 and causes an actuation signal to be conveyed over an appropriate wire 78.

[0045] In light of the above-description, those skilled in the art will appreciate that the present invention provide a significant advantage over prior art systems by eliminating cables from the shooting range firing area. Additionally, the person operating the range is given greater mobility.

[0046] Thus there is disclosed an improved remote target control system. Those skilled in the art will appreciate numerous modifications which can be made without departing from the scope

and spirit of the present invention. The appended claims are intended to cover such modifications.

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